

WHAT IS CLAIMED IS:

1. A high-frequency power amplifier circuit with a plurality of cascaded semiconductor amplifier devices, comprising semiconductor amplifier devices each making up a current mirror circuit with each of the plurality of semiconductor amplifier devices; wherein the semiconductor amplifier devices receive currents that vary with given characteristics according to a control voltage, and the plurality of semiconductor devices are driven by the currents.

2. The high-frequency power amplifier circuit according to claim 1, wherein the semiconductor devices are field-effect transistors and the given characteristics are gate voltage-drain current characteristics of the field-effect transistors.

3. A high-frequency power amplifier circuit comprising:

an output circuit with a plurality of cascaded semiconductor devices;

a bias circuit that drives the semiconductor amplifier devices according to a control voltage; and

semiconductor devices that are arranged so as to construct current mirror circuits with the plurality of semiconductor amplifier devices,

wherein the bias circuit includes a voltage-to-current converter that converts a control voltage to current; a first resistance for converting current supplied from the voltage-to-current converter to a voltage; a first current source; a first semiconductor amplifier device connected to the first current source in series; a control voltage generator that generates a voltage equal to the threshold voltage of the first semiconductor amplifier device; and a second semiconductor amplifier device that generates current responsive to the combination of a voltage generated in the control voltage generator and a voltage converted by the first resistance, wherein a current with a characteristic responsive to current flowing into the second semiconductor amplifier device is supplied to the semiconductor devices arranged so as to form the current mirror circuits, and the semiconductor amplifier device is driven by the current.

4. The high-frequency power amplifier circuit according to claim 3, wherein the control voltage generator has a voltage follower that receives a voltage equal to the threshold voltage of the first semiconductor amplifier device, the output terminal of the voltage follower is connected to the first resistance, and current is supplied to the voltage follower from the voltage-to-current converter via the first resistance.

5. The high-frequency power amplifier circuit according to claim 4, further comprising a second current source that is connected to the control terminal of the second semiconductor amplifier device and sinks current supplied from the voltage-to-current converter.

6. The high-frequency power amplifier circuit according to claim 5, wherein the first power source has a differential circuit that receives constant voltage from a constant-voltage circuit as an input and a third semiconductor amplifier device that passes a constant current according to the output voltage of the differential circuit.

7. The high-frequency power amplifier circuit according to claim 6, wherein the differential circuit has an output connected to the gate terminal of an amplifier device arranged so as to form a current mirror circuit with the third semiconductor amplifier device, the second resistance is connected to the amplifier device in series, the differential circuit outputs voltage proportional to the constant voltage when a potential at the point of interconnection of the amplifier device and the second resistance is fed back to the input terminal of the differential circuit, the third semiconductor amplifier device is driven by the voltage output from the differential

circuit to carry constant current, and the second resistance is an external device.

8. The high-frequency amplifier circuit according to claim 7, wherein the second current source has a second differential circuit that receives a constant voltage from the constant-voltage circuit as an input and a fourth semiconductor amplifier device that supplies constant current according to the output of the second differential circuit.

9. The high-frequency amplifier circuit according to claim 8, wherein the second differential circuit has an output connected to the gate terminal of the amplifier device that is arranged so as to form a current mirror circuit with the fourth semiconductor amplifier device; a third resistance is connected to the amplifier device in series, the second differential circuit outputs a voltage proportional to the constant voltage when a potential at the point of interconnection of the amplifier device and the third resistance is fed back to the input terminal of the second differential circuit, the fourth semiconductor amplifier device is driven by the voltage output from the second differential circuit to carry constant current, and the third resistance and the first to fourth semiconductor amplifier devices are formed on the same semiconductor chip.

10. The high-frequency power amplifier circuit according to claim 9, wherein the first resistance, the second semiconductor amplifier device, and the second current source are provided corresponding to each of the plurality of the semiconductor amplifier devices, a resistance value of the first resistance provided corresponding to each of the plurality of the semiconductor amplifier devices and a current value of the second current source provided corresponding to each of the plurality of the semiconductor amplifier devices are set to mutually differing values.